

***AN ARCHAEOLOGICAL SURVEY FOR THE
CHATFIELD WATER SUPPLY CORPORATION
WATER SYSTEM IMPROVEMENTS PROJECT
IN NAVARRO COUNTY TEXAS***

Antiquities Permit 4041



***By
William E. Moore***

***Brazos Valley Research Associates
Contract Report Number 160***

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AN ARCHAEOLOGICAL SURVEY FOR THE CHATFIELD
WATER SUPPLY CORPORATION WATER SYSTEM
IMPROVEMENTS PROJECT IN NAVARRO COUNTY, TEXAS

BVRA Project Number 05-20

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ABSTRACT

An archaeological survey for the proposed improvements to the Chatfield Water Supply Corporation (WSC) water system was conducted on February 22, 2006 by Brazos Valley Research Associates (BVRA) in east-central Navarro County, Texas. Five high probability areas pre-selected by the Texas Historical Commission were examined for the presence of significant prehistoric and/or historic sites within the Area of Potential Effect (APE). Two cemeteries are near the proposed route of the water line. These are the Petty's Chapel Cemetery and the Navarro County Cemetery. The Petty's Chapel Cemetery was established in the late 1800s, is fenced, and contains graves dating to the 19th and 20th centuries. The Navarro County Cemetery was established in the 1880s and is the final resting place for indigent persons, mentally ill patients, and prisoners buried by the county. These sites will be avoided by the planned construction. No previously unrecorded sites (prehistoric or historic) were found. This investigation was performed under Antiquities Permit 4041. In all, six acres were examined, and no artifacts were collected. Copies of the report are on file at the Texas Historical Commission, Archeology Division and the Texas Archeological Research Laboratory in Austin, Texas.

ACKNOWLEDGMENTS

Brazos Valley Research Associates is grateful to those whose cooperation made the completion of this project possible. Bezel Strange is the General Manager/Operator for the Chatfield WSC. Mr. Strange arranged for a pre-field check for buried utilities and visited with the Principal Investigator during the survey. In addition, he provided two workers who provided assistance. They are Mike Craig (Operator) who supervised the backhoe trenching and Joe Greenwell (General Contractor) who operated the backhoe. Hollie H. Nowlin is the engineer for this project and works for J. F. Fontaine & Associates, Inc. in Palestine, Texas. Ms. Nowlin provided maps and visited the five high probability areas with the Principal Investigator during the pre-survey evaluation. Jean Hughes, Records Conservator at the Texas Archeological Research Laboratory performed the records search for previously recorded sites and past surveys in the project area and vicinity. Archaeological Steward Bill Young (Lakes/Brazos Region) provided information regarding the two cemeteries near the project area, and Navarro County Sheriff Leslie Cotton took time from his busy schedule to discuss the history of the Navarro County Cemetery. Lili Lyddon of Lyddon Illustrations in Wellborn, Texas prepared the figures that appear in this report, and Nora Rogers edited the manuscript. The field crew consisted of James E. Warren, Arthur Romine, and Bobby Jemison.

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INTRODUCTION

The Chatfield WSC is applying for funds from the United States Department of Agriculture, Rural Development to improve its water distribution system by adding 43.61 miles of new water line throughout the east-central portion of Navarro County (Appendix I). Additional improvements consist of a 50,000 gallon ground storage tank and a 6000 gallon pressure tank at existing Water Treatment Plant 1 and increasing plant piping sizes at existing plants 2 and 5. Valves, fittings, road bores, encasements, and creek crossings will be installed as needed. The diameter of the water line in the areas investigated vary from 6 inches to 12 inches. They will be placed in a trench with three feet of cover, and the project area right-of-way is 15 feet.

The new water line will generally follow state and county road rights-of-way and private property next to roads. Large trees within the paths of pipelines will be by-passed to avoid damage to trees. Prime farmland will be crossed by the proposed pipelines in some areas, but they will generally follow previously disturbed routes of the existing pipeline. Flood plains and wetland areas located at creeks will be crossed by proposed water lines. Creek crossings will be encased and restored to their original condition. There will be no permanent structures located within flood zones or wetland areas. The Chatfield WSC will adopt binding resolutions protecting the flood plains and wetland areas from future development. The Bald Eagle is the only Federally listed threatened species in Navarro County. Habitats of this species will not be disturbed, and no adverse impact will affect this threatened species.

Part of the area proposed for new water line has already been investigated by professional archaeologists, and significant prehistoric and historic sites were found. In order to ensure that important cultural resources in those areas not surveyed are not destroyed by the proposed construction, the Texas Historical Commission selected five high probability areas and requested that they be examined by a professional archaeologist. In order to fulfill this requirement, Chatfield WSC contracted with BVRA to provide this service. Figure 1 depicts the five areas investigated and described in this report.

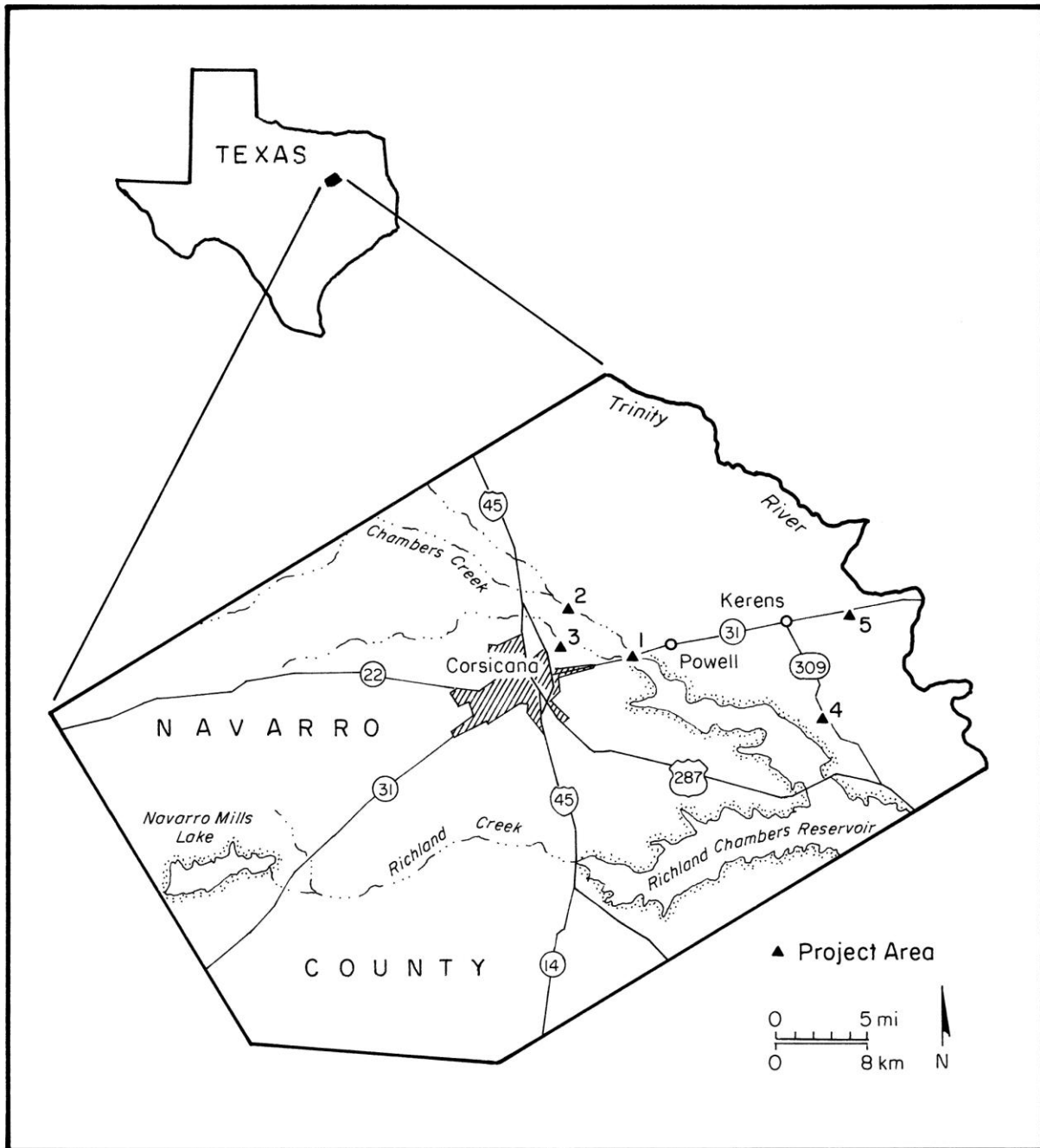


Figure 1. Project Area

ENVIRONMENTAL SETTING

General

The project area is located near the western extreme of the West Gulf Coast Plain physiographic province as defined by Fenneman (1931:100-102). It is located east of the Central Texas Section of the Great Plains physiographic province (Fenneman 1931:54-55). According to the *Handbook of Texas* (Webb 1952:263), Navarro County is in the great Blackland Prairie region of North Central Texas and has an area of 1084 square miles. The altitude of the county is 450 feet, rainfall is 35.96 inches, and the annual temperature is 66.2 degrees Fahrenheit. The ground surface is level in the central and western parts of the county and rolling hills are present in the northeast part of the county. The soils along the many tributaries of the Trinity River are deep, black waxy and loam soils and rich bottomlands.

Soils

Area 1

The soils in Area 1 belong to the Trinity series. In the area investigated, the soils are Trinity Clay, frequently flooded (Tr). This soil is described by Meade et al. (1974:29) as being located on flood plains. In some areas scour channels are numerous, and in other areas they are few. This soil is subject to flooding every two or three years. A typical profile consists of very dark gray clay (10YR 3/1) from 0-24 inches, dark gray clay (5YR 4/1) from 24 to 36 inches, black clay (10YR 2/1) from 36 to 48 inches, and black clay (10YR 2/1) from 48 to 58 inches. The A1 horizon ranges from 34 to more than 62 inches in thickness.

Area 2

The soils in Area 2 are identical to those described above for Area 1.

Area 3

The soils in Area 3 belong to the Burleson series. In the area investigated, the soils are Burleson clay, 0 to 1 percent slopes (BuA). This soil is described by Meade et al. (1974:11) as a nearly level soil on broad uplands or narrow ridge tops. Others are in slightly depressed areas where water stands for a short time. A typical profile consists of a very dark gray clay (10YR 3/1) from 0 to 8 inches, a very dark gray clay (10YR 3/1) or black clay (10YR 2/1) 8 to 30 inches, a dark gray clay (10YR 4/1) or a very dark gray clay (10YR 3/1) from 30 to 45 inches, and a gray clay (10YR 5/1) or dark gray clay (10YR 4/1) from 45 to 63 inches.

The A horizon consists of a dark gray clay, very dark gray clay, or black clay that ranges from medium acid to moderately alkaline in reaction.

The AC horizon ranges from 8 to 34 inches in thickness. Reaction ranges from neutral to moderately alkaline.

The C-horizon, generally below a depth of about 63 inches, is mottled in shades of gray, yellow, brown, and olive. Reaction is mildly alkaline to moderately alkaline.

Area 4

The soils in Area 4 belong to the Axtell, Crockett, Gowen, Tabor, and Wilson series. In the area investigated, the soils are Axtell fine sandy loam, 1 to 3 percent slopes (AxB), Crockett fine sandy loam, 0 to 1 percent slopes, Gowen fine sandy loam, frequently flooded (Go), Tabor fine sandy loam, 0 to 1 percent slopes (TaA), and Wilson very fine sandy loam, 0 to 1 percent slopes (WIA).

The Axtel soil is described by Meade et al. (1974:7) as a gently sloping soil on broad upland ridge tops. A typical profile consists of light brownish-gray fine sandy loam (10YR 6/2) and dark grayish-brown fine sandy loam (10YR 4/2) from 0 to 4 inches; very pale brown fine sandy loam (10YR 7/3) and pale brown sandy loam (10YR 6/3) from 4 to 10 inches; mottled grayish-brown (10YR 5/2), yellowish-red (5YR 4/6), and light olive brown (2.5 YR 5/4) clay from 10 to 18 inches. This clay is very firm, very sticky, and very plastic. Clay soils continue to 82 inches. At 82 inches, a yellowish-brown 10YR 5/4 very fine sandy loam overlies a layer of weakly cemented light olive brown sandstone.

The Crockett soil is described by Meade et al. (1974:13) as a nearly level soil on broad uplands or narrow ridge tops throughout the county. The surface layer is a brown fine sandy loam about 6 inches thick. The next layer is a very firm clay to a depth of about 68 inches. The underlying material is a mottled white, gray, yellowish-brown, and olive brown firm clay to a depth of about 100 inches.

The Gowen soil is described by Meade et al. (1974:18) as a being found in the floodplains of streams. The areas are long and narrow and follow the contour of the floodplain. This soil is subject to flooding every two to three years during the growing season. Numerous short, scour channels cut into most areas, and the relief is slightly undulating. The surface layer is a grayish-brown fine sandy loam about 10 inches thick. The next layer is a dark grayish-brown clay loam to a depth of about 45 inches. The underling sediment is a grayish-brown loamy material to a depth of about 60 inches.

The Tabor soil is described by Meade et al. (1974:29) as a nearly level upland soil occurring mainly as broad watershed divides. In undulating areas, water stands for brief periods.

The Wilson soil is described by Meade et al. (1974:31) as a nearly level soil on uplands. It occupies broad watershed divides or areas adjacent to streams. The surface layer is a grayish-brown, very friable, very fine sandy loam about 6 inches thick. The next layer is a dark gray very firm clay about 18 inches thick. The underlying material is a mottled light gray, light olive brown, and grayish-brown very firm clay to a depth of about 60 inches.

Area 5

The soils in Area 5 belong to the Axtell and Wilson series. In the area investigated, the soils are Axtell fine sandy loam, 1 to 3 percent slopes (AxB) and Wilson very fine sandy loam, 0 to 1 percent slopes (WIA). These soils are described for Area 4 above.

ARCHAEOLOGICAL BACKGROUND

Navarro County is located in the North Central Texas region as defined by Biesaat et al. (1985:76) in *Prehistoric Archeological Sites in Texas: A Statistical Overview* published by the Office of the State Archeologist, Texas Historical Commission. This is an area that was well documented in terms of numbers of sites in 1985 when compared to other regions of Texas. When the statistical overview was compiled, a total of 2678 prehistoric sites (13.25% of the state) was recorded in the entire region, mainly due to work on Richland and Chambers creeks. Only the Central Texas region reported more sites or had a higher percentage statewide, and only four counties, Bell (197), Coleman (151), Dallas (204), and Hill (242) had more recorded sites (Biesaat et al. 1985:83). The 132 sites recorded in Navarro County in 1985 consisted of 4.93% of the region and .65% of the state. The reader is referred to the overview for additional statistical information concerning Navarro County and its relation to the rest of Texas.

Previous work in the county has been synthesized by Calvin B. Sanders (1996) in his survey report entitled *Cultural Resources Survey of the Mill Creek Project, Navarro County, Texas*. The following discussion is taken from his work and other major reports, especially those dealing with studies along Richland and Chambers creeks.

Most of the archaeological investigations in Navarro County have been the result of archaeological salvage projects associated with reservoir construction, often involving multiple counties. The earliest reservoir projects were conducted in the 1960s and include Navarro Mills (Duffield 1960, 1963) and Bardwell (Shafer 1964; Sorrow 1966). Tennessee Colony Reservoir was the scene of archaeological activity in the 1970s (Richner and Lee 1976; Richner and Bagot 1978; Richner 1982). The majority of archaeological data for Navarro County was collected during surveys at Richland and Chambers creeks in the 1970s and 1980s. Most of these studies were the result of proposed watershed projects by the Soil Conservation Service, and much of the work was performed by Southern Methodist University. Later, when the Richland-Chambers Reservoir was proposed, archaeologists were on hand to survey there as well (Raab et al. 1980, 1981).

Excluding work at Richland-Chambers Reservoir, only seven archaeological surveys are documented by Sanders (1996:9-10) in the Chambers Creek watershed with the first conducted by C. Reid Ferring (1975). Ferring's work "revealed a relative absence of sites on the ephemeral drainages in which the majority of planned floodwater structures are located" (Sanders 1996:9). The only exceptions were two lithic quarries on terraces near Chambers Creek proper (Ferring 1975:3-4). Ferring hypothesized that the paucity of knappable raw material may have been a factor in the low number of sites in the areas surveyed.

Other surveys conducted by Soil Conservation Service archaeologists have reported similar results. Nancy M. Cole (1981) found only one prehistoric lithic scatter on an eroded and heavily disturbed upland area, and the last professional archaeological investigation in this watershed (Nunley 1983) failed to locate prehistoric sites in either of the three floodwater retarding structures examined. According to Nunley (1983:4), the results of his study provided further evidence "supporting the relative scarcity of significant cultural resources in upland areas of the Blackland Prairie suggested in the previous investigations."

Of particular relevance to this study is the survey conducted by BVRA in 1997 on Mill Creek in northwest Navarro County (Moore and Bradle 1997). A combined Phase II and Phase III significance testing of site 41NV670 was performed to determine the research potential of this unique site which consisted of a bison bone bed approximately 15 feet below the surface of a relict flood plain and within a heavy clay mantle.

This investigation was performed using shovel testing, excavation of two 1 x 1 meter test units, one backhoe trench, surface inspection of creek exposures, and an evaluation by a geomorphologist. Site 41NV670 consists of a stratum of bison bone identified as modern bison (*Bison bison*) representing minimally five individuals. The only other identified species in the faunal assemblage was white-tailed deer (*Odocoileus virginianus*) represented by a single scaphoid carpal. Although no conclusive evidence of cultural modification to the bone was observed during the laboratory analysis, the presence of human intervention was found in the form of possible burned bone (field observation); flakes; biface fragments; two arrow points; and burned rock, charcoal, and ash. This site is located in the Mill Creek paleosol. Radiocarbon dates taken from charcoal mixed with bison bone in test unit N200/E201 produced a conventional radiocarbon age of 390 \pm 60 years Before Present (B.P.). The calibrated results, prepared by Beta Analytic Radiocarbon Dating Laboratory, produced calendar dates of A.D. 1425 to A.D. 1650 (2 sigma, 95% probability).^{*} These dates place site 41NV670 in the Late Prehistoric or Protohistoric period.

During the Phase II and Phase III testing of site 41NV670, one previously unrecorded site (41NV671) was found on the south bank of Mill Creek approximately 200 meters to the west of the project area. Site 41NV671 is a small hearth about twelve feet below the current flood plain on the south bank of Mill Creek. The hearth is located in the Navarro paleosol, the geological stratum underlying the Mill Creek paleosol containing site 41NV670. Radiocarbon dates obtained from charcoal extracted from the hearth produced a conventional radiocarbon age of 580 \pm 60 years B.P. The calibrated results, prepared by Beta Analytic Radiocarbon Dating Laboratory, produced calendar dates of A.D. 1290 to A.D. 1440 (2 sigma, 95% probability).

Several archaeological sites have been recorded in close proximity to the five high probability areas examined during this survey. Prehistoric sites have been recorded in flood plains, on terraces, and in the uplands. Nearby historic sites include an abandoned iron bridge across Chambers Creek and a road. In addition, to the above-mentioned reports, additional information for the area can be found in a very thorough report published by the Texas Historical Commission entitled *Archeology in the Eastern Planning Region: A Planning Document* (Kenmotsu and Perttula 1993).

METHODS

Pre-Field Tasks

Prior to entering the field, the site records at the Texas Archeological Research Laboratory on the campus of The University of Texas at Austin were checked for the presence of previously recorded archaeological sites in or near the project area. This task was performed by Jean Hughes at the Texas Archeological Research Laboratory. Additional background research was performed by the Principal Investigator utilizing the Texas Historic Sites Atlas and the Handbook of Texas Online. In addition, reports describing past investigations by professional archaeologists in the vicinity were reviewed. A field evaluation of the five high probability areas was conducted by the Principal Investigator and Hollie H. Nowlin of J. F. Fontaine & Associates, Inc., the engineering firm associated with this project. This evaluation allowed the Principal Investigator to better plan the field survey.

Field Survey

The five pre-selected areas were designated as areas 1-5 for convenience. The methods employed during this survey followed a Research Design (Appendix I) submitted to the Texas Historical Commission for approval prior to entering the field. When possible, eroded and otherwise exposed areas within the various rights-of-way were examined for surface indications of prehistoric and/or historic sites in each of the five high probability areas. The subsurface was examined through backhoe trenching and shovel testing. Backhoe trenching was performed at two locations where the water line will cross Chambers Creek. Each trench was excavated to the depth of the APE. Trench profiles were drawn (Appendix II), and Munsell readings were taken of the soils present. Four trenches were excavated in each of the two flood plains of Chambers Creek (Area 1 and Area 2). Shovel tests and probes were dug along the rights-of-way in areas 3-5. Shovel probes differ from shovel tests in that these areas where the soil was tested for shallow clays and various forms of disturbance. Probes are not dug by levels, the earth is not screened, and the locations of probes are not depicted on the project area maps. The earth excavated during shovel testing was passed through quarter-inch hardware cloth, the depth of each test is measured in the field, and they are plotted on the project area maps. In some cases, heavy clays made screening impossible. The earth from these tests was examined by manually breaking apart the clay. In all, 14 shovel tests were excavated in the three areas. A shovel test log describing the results of this task is presented as Appendix III to this report.

During the course of this survey, two cemeteries were observed near the route of the proposed water line. These are Petty's Chapel and the Navarro County Cemetery. Since these historic sites are outside the project area, no site numbers were assigned. They were photographed and discussed (see *Results and Conclusions* below). Also, local informants with knowledge of the cemeteries were interviewed.

AREAS SURVEYED

Area 1

Area 1 is the crossing of State Highway 31 at Chambers Creek on the north side of the road (Figure 2). Originally, the water line was to be placed on the south side of the highway, but it was moved to the north side of the road due to the presence of numerous utilities on the south side. This area is depicted on the Powell 7.5' topographic quadrangle and is 2700 feet long. The proposed water line will be 12 inches in diameter and will be placed in a trench with at least three feet of cover. Four backhoe trenches (1-4) were excavated on the east side of the creek within the flood plain. No trenches were excavated on the west side of the creek, because this is an active flood plain with standing water present. The flood plain on the east side of the creek is much higher and was dry at the time of this survey.

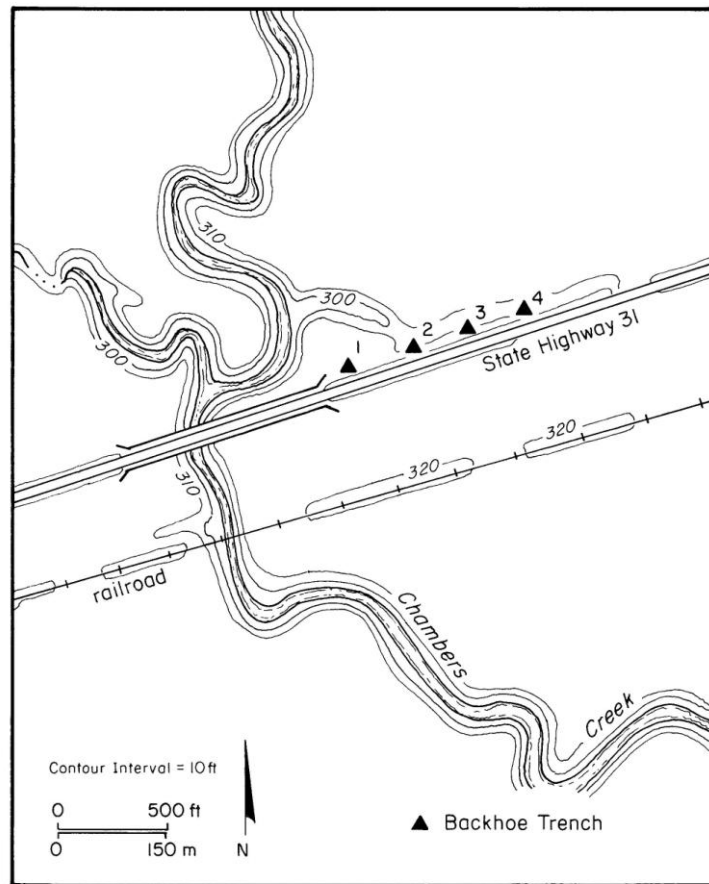


Figure 2. Area 1

Area 2

Area 2 is the crossing of Farm-to-Market Road 3041 (Chatfield Road) at Chambers Creek on the east side of the road (Figure 3). This area is depicted on the Chatfield 7.5' topographic quadrangle and is 2800 feet long. The proposed water line will be 6 inches in diameter and will be placed in a trench with at least three feet of cover. Three backhoe trenches (6-8) were excavated on the south side of the creek within the flood plain, and one backhoe trench (5) was excavated on the north side of the creek within the flood plain.

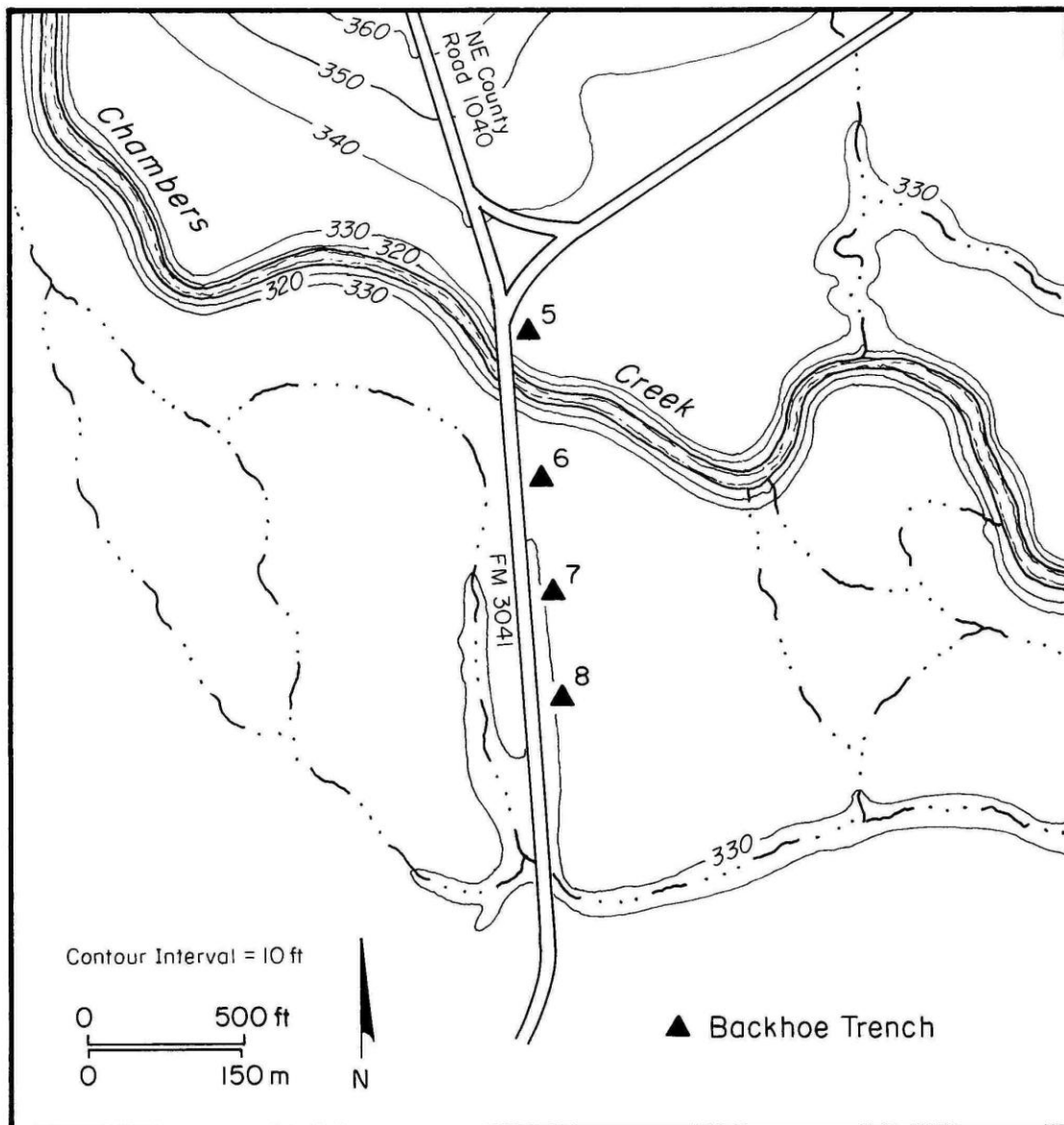


Figure 3. Area 2

Area 3

Area 3 parallels the east side of NE County Road 0060, crosses an unnamed tributary of Briar Creek, and terminates at Farm-to-Market Road 3041 (Figure 4). This area is depicted on the Corsicana 7.5' topographic quadrangle and is 5400 feet long. The proposed water line will be 6 inches in diameter and will be placed in a trench with at least three feet of cover. Three shovel tests (6-8) were excavated on the north side of the tributary, and two tests (9-10) were excavated on the south side of the tributary.

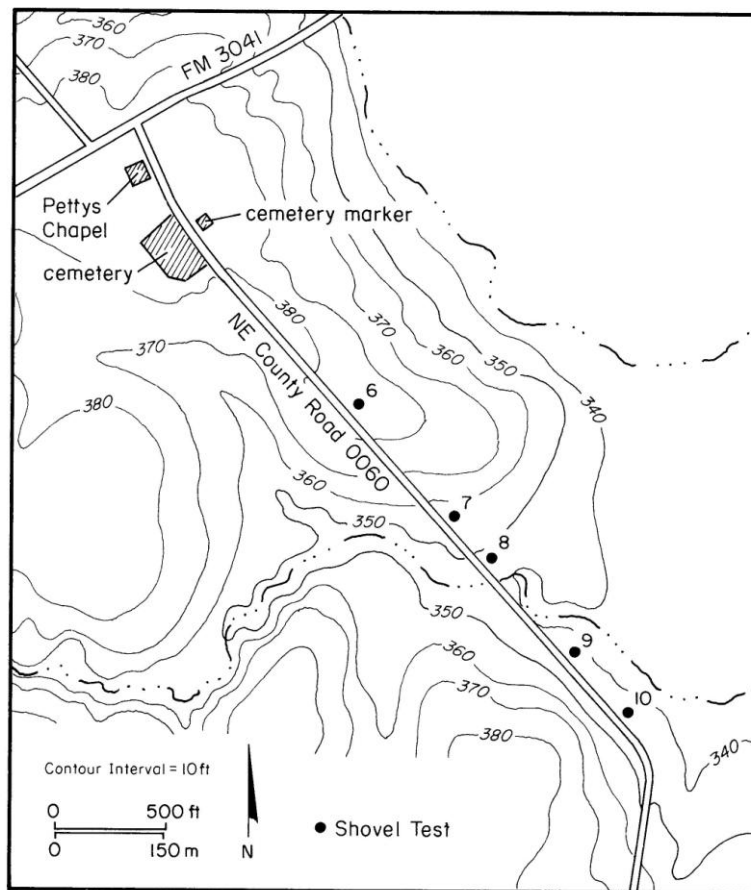


Figure 4. Area 3

Area 4

Area 4 parallels the south side of an unnamed, unpaved road and the east side of a segment of County Road 3240 (Figure 5). This area is depicted on the Goodlow Park 7.5' topographic quadrangle and is 4000 feet long. The proposed line will be 6 inches in diameter and will be placed in a trench with at least three feet of cover. Two shovel tests (11-12) were excavated on the west side of an unnamed tributary of Alligator Creek, and two shovel tests (13-14) were excavated on the east side of this same tributary.

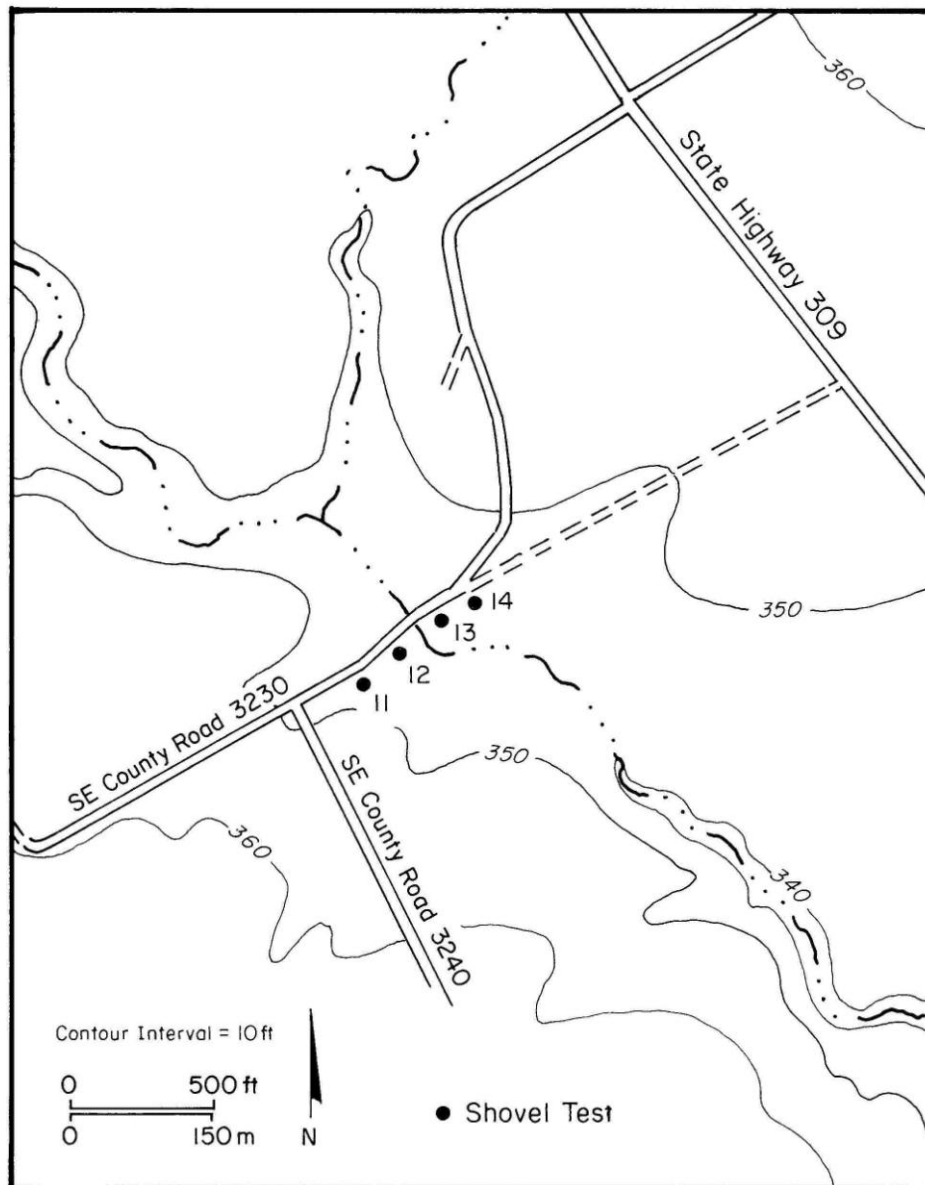


Figure 5. Area 4

Area 5

Area 5 is a cross-country segment that connects State Highway 31 with SE County Road 4040 (Figure 6). This 2500 foot area is depicted on the Kerens 7.5' topographic quadrangle. The proposed line will be 4 inches in diameter and will be placed in a trench with at least three feet of cover. Six shovel tests (1-6) were placed on the east side of the flagged line that will be installed adjacent to an existing line. The only water source in the area is an unnamed tributary of Indian Creek.

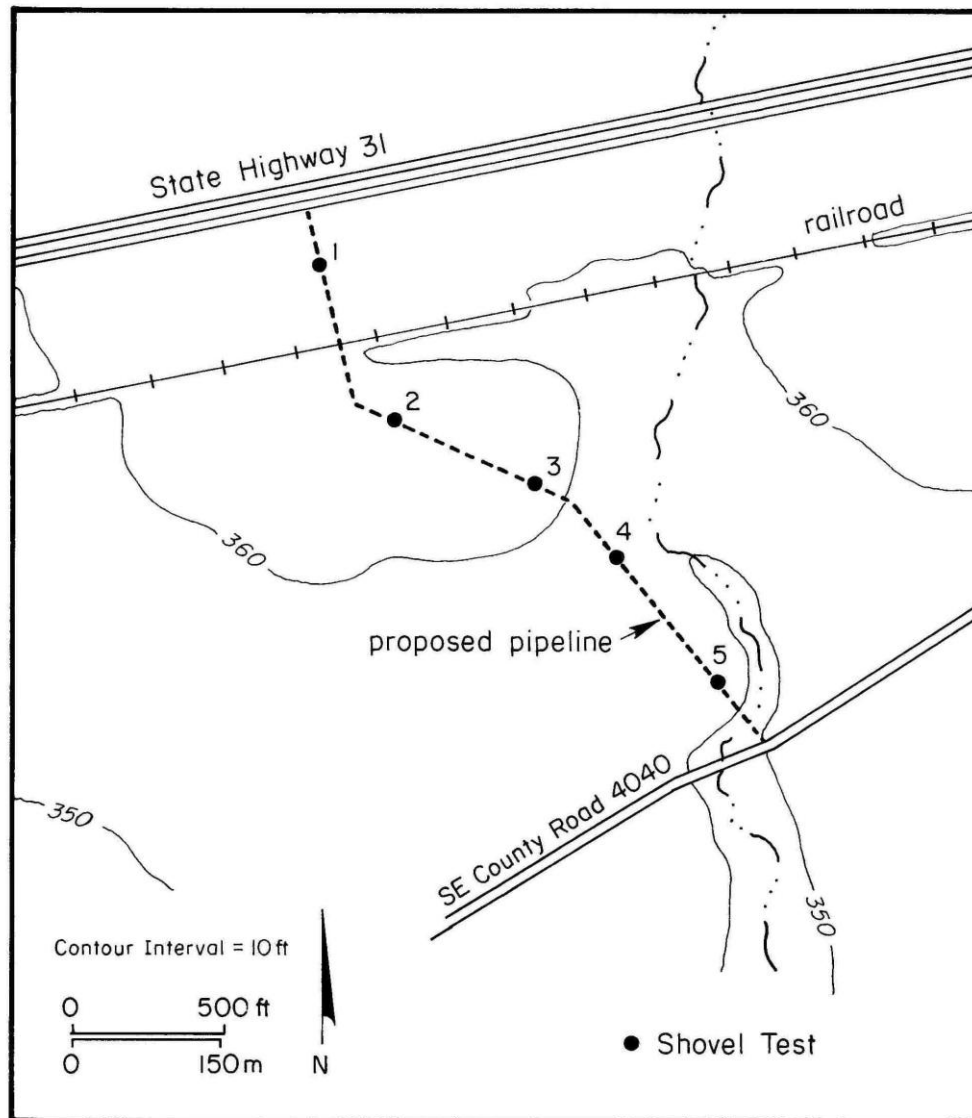


Figure 6. Area 5

RESULTS AND CONCLUSIONS

The background check revealed the presence of significant prehistoric and historic sites near the project area. No previously unrecorded prehistoric sites were found within the APE. Backhoe trenches were excavated in the relict flood plains of Area 1 and Area 2. These trenches were terminated at the depth of the proposed water line; therefore, it is not known if buried sites are present below the bottom of these trenches. The remaining three areas (3-5) were investigated by a Pedestrian Survey and shovel testing and probing. Not one of these areas cross major streams, and the soils consist of clays at or near the surface. BVRA believes that these areas were not utilized by prehistoric groups because of an absence of dependable water and a lack of raw materials for the manufacture of stone tools. Previous work by other archaeologists have found that prehistoric sites are typically found along major creeks and rivers or in areas where chert cobbles suitable for the manufacture of stone tools are present on the surface.

Two cemeteries are located just outside the highway right-of-way along NE County Road 0060 in Area 3 (Figure 7). They are the Petty's Chapel Cemetery and the Navarro County Cemetery. The Petty's Chapel Cemetery is associated with the Petty's Chapel church and is on the southwest side of the county road. This cemetery was established in the 1870s or 1880s, and the oldest known graves date to circa 1881-1882. It is enclosed by a modern chain-link fence.

The Navarro County Cemetery is located in a pasture on the northeast side of the county road almost directly across from the Petty's Chapel Cemetery. It was associated with the "Navarro County Poor Farm" which was established in the 1880s for indigent people. Housing and land for gardens were provided to those persons with no income. Also, this area contained a two-story brick jail for county prisoners and the mentally ill. The cemetery became the final resting place for the residents of the farm. Since the wooden crosses were removed in the 1940s, it is not known how many graves are present in the pasture. Archeological Steward Bill Young estimates the number to be at least 230. In 1944, a granite marker was constructed on the site to mark the location of the cemetery (Figure 8). Additional information regarding these cemeteries and the history of Navarro County is on file at the Navarro County Historical Society Museum at Pioneer Village in Corsicana.

This survey was conducted according to the Minimum Survey Standards as recommended by the Texas Historical Commission.



Figure 7. Petty's Chapel Cemetery



Figure 8. Navarro County Cemetery

RECOMMENDATIONS

No prehistoric or historic sites were found in areas 1-2 and 4-5. It is therefore recommended that construction of the water line be allowed to proceed as planned. Should evidence of an archaeological site be found in any of these areas construction must stop until the situation can be evaluated by the Texas Historical Commission. Two cemeteries are present just outside the county road right-of-way in Area 3. Since the county road was widened and straightened by the Texas Department of Transportation in 1999 and 2000, the chance of unmarked graves within the right-of-way is believed to be low. Therefore, it is recommended that the water line be placed in the center of the ditch within the county right-of-way or in the center of the unpaved road when digging adjacent to these cemeteries. Should any evidence of a grave be encountered during the installation of the water line, all work must stop until the situation can be evaluated by the Texas Historical Commission, Archeology Division.

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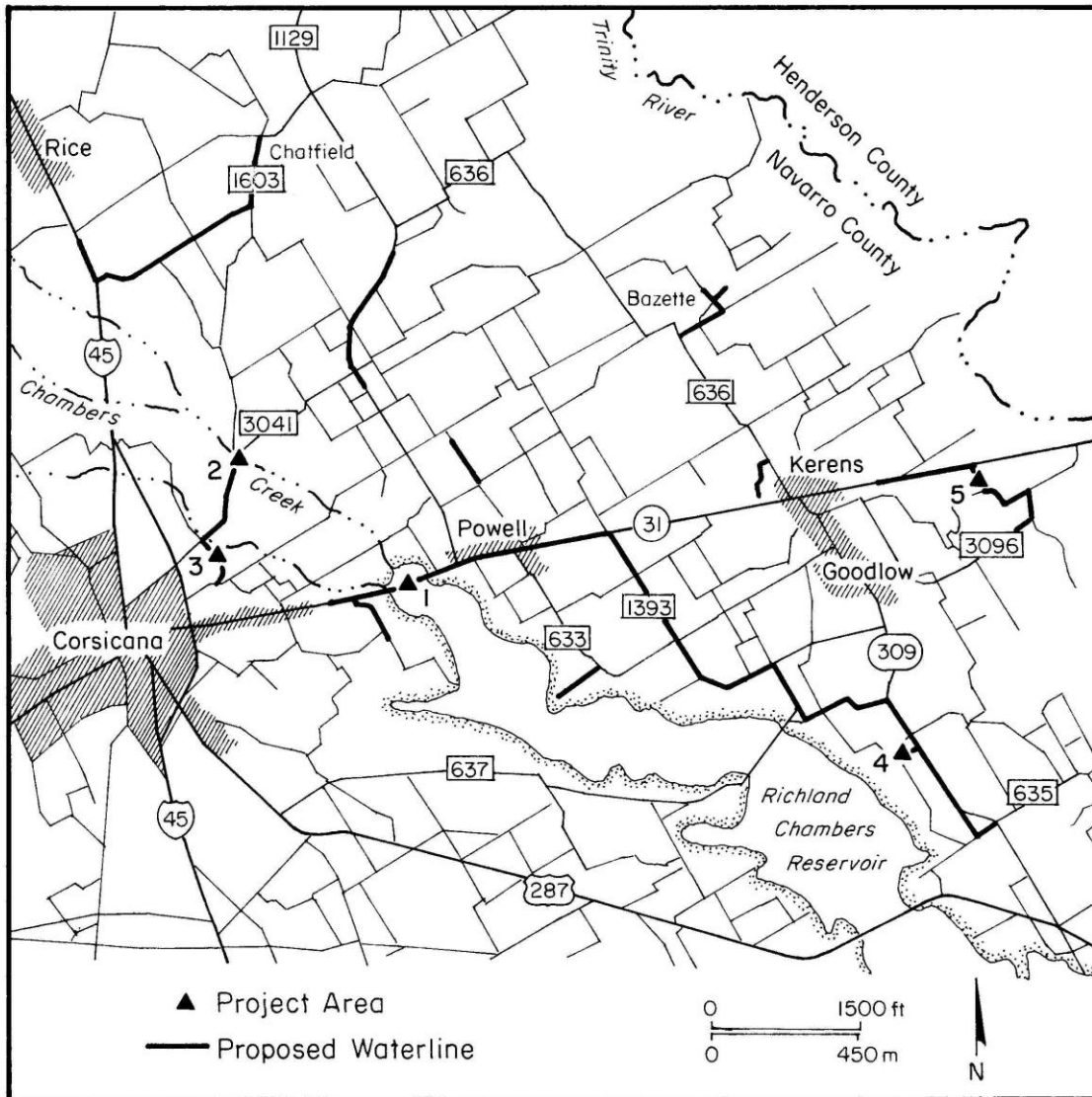
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APPENDIX I: ENTIRE ROUTE OF WATER LINE



APPENDIX II

RESEARCH DESIGN

CHATFIELD WATER SUPPLY CORPORATION

Records Check

Brazos Valley Research Associates (BVRA) will contact the Texas Archeological Research Laboratory (TARL), the state repository for site records, to determine if previously recorded sites are present in the project area. In addition, a review of relevant archaeological reports will be conducted.

Project Description

The Chatfield Water Supply Corporation (WSC) proposes to improve its water system by adding 43.61 miles of water line to its customers in rural Navarro County. Pipeline locations will generally follow road rights-of-way and private property adjacent to roads.

Removal of large trees within paths of pipelines will be by-passed to avoid damage to trees. Prime farmland will be crossed by the proposed pipelines in some areas, but will follow previously disturbed routes of the existing pipeline. Flood plains and wetland areas located at creeks will be crossed by proposed water lines. In these areas, the water lines will be encased and the land will be restored to its original condition. There will be no permanent structures located within flood zones or wetland areas. The Chatfield WSC will adopt binding resolutions protecting the flood plains and wetland areas from future development. The Bald Eagle is the only Federally listed threatened species in Navarro County. Habitats of this species will not be disturbed, and no adverse impact will effect the threatened species.

The water line will be placed in a trench approximately 1.5 feet wide and will be buried beneath 36 inches of cover.

Areas to Survey

In an email from Debra Beene of the Texas Historical Commission (THC) to Hollie Nowlin of the engineering firm J. F. Fontaine & Associates, Inc. dated December 13, 2005, five areas were selected by the THC for survey. According to Ms. Beene, most of the 43 mile pipeline has been examined by professional archaeologists. The five areas are discussed below:

RESEARCH DESIGN (PAGE TWO)

Area 1

This is the crossing of State Highway 31 at Chambers Creek on the south side of the road. A visual inspection by the Principal Investigator on February 9, 2006 revealed a broad flood plain that appears to be relatively undisturbed. BVRA recommends excavating three backhoe trenches within the highway right-of-way within the flood plain on the east side of Chambers Creek and one backhoe trench on the west side of Chambers Creek. These trenches will be dug to the depth of the Area of Potential Effect (APE). Since the soils in this area are heavy clays, screening of the excavated soil will not be possible. The intent of the backhoe trenches is to look for buried features. If an intact feature is observed, it will be left in place. Diagnostic artifacts (if any) removed from their original context during backhoe trenching will be collected for analysis and curation.

Area 2

This is the crossing of Chatfield Road at Chambers Creek. On the east side of the road. A visual inspection by the Principal Investigator on February 9, 2006 revealed a broad flood plain that appears to be relatively undisturbed. BVRA recommends excavating three backhoe trenches on the south side of Chambers Creek and one backhoe trench on the north side of Chambers Creek following the same methods described above.

Area 3

This is the route of the proposed water line along the east side of a county road. A visual inspection by the Principal Investigator on February 9, 2006 revealed a route that does not cross any major streams. In places there is an existing ditch where the water line will be placed. BVRA classifies this as a very low probability area for prehistoric sites. Shovel probes will be excavated along this route to test for sandy soils. If the soils prove to be clay at the surface shovel testing will not be performed since there is little chance for buried sites in the upland clays.

The Principal Investigator observed a historic cemetery adjacent to the road. It will be documented and discussed in the report, but it is outside the APE. In addition, there is a marker in a pasture noting the apparent presence of another cemetery. This will be researched to determine the probability of graves in the area.

RESEARCH DESIGN (PAGE THREE)

Area 4

This is the route of the proposed water line along the south and west sides of a county road. A visual inspection by the Principal Investigator on February 9, 2006 revealed a route that does not cross any major streams. In places there is an existing ditch where the water line will be placed. BVRA classifies this as a very low probability area for prehistoric sites. No historic sites were observed within the APE. The soils will be tested by shovel probing at both sides of the crossing of an unnamed tributary. BVRA believes the upland margin to the south and west overlooking Chambers Creek is a more likely setting for prehistoric sites.

Area 5

This is a cross-country route of the proposed water line from State Highway 31 to a county road. The Principal Investigator was only able to view the area from the road. According to the topographic map, no major streams are crossed and no historic structures are depicted. BVRA believes this to be a very low probability area for the presence of a prehistoric site. The area will be walked and probed with a shovel. The crew will be looking for evidence of historic utilization in this area.

Site Types

Based on previous work in the area, prehistoric archaeological sites are known to occur in a variety of settings. Habitation sites are mostly commonly found on the lower terraces adjacent to streams, while lithic quarries have been recorded in all settings where chert cobbles were available in prehistoric times. Lithic scatters and hearths are found on terraces and uplands. Buried sites may be found in the floodplains of major streams. A previous investigation by BVRA examined a buffalo bone bed on Mill Creek at 14 feet below the surface in heavy clay. Arrow points were found in association with the bone. Historic archaeological sites are not always tied directly to water and may be found in areas between streams.

Survey Methods

The Principal Investigator and Project Archaeologist for this project is William E. Moore. No fieldwork will commence until an Antiquities Permit has been issued. The entire project area was assessed by the Principal Investigator accompanied by Hollie Nowlin of J. F. Fontaine and Associates, Inc., the engineering firm associated with this project. The following methods are based on this "windshield survey" and a review of previous work in the area.

RESEARCH DESIGN (PAGE FOUR)

All exposed ground surfaces will be carefully inspected for cultural materials and features. Normally only diagnostic artifacts will be collected from the surface of a site. Quarry or lithic procurement sites will be treated differently. In these areas, a controlled collection of cultural materials may be made to identify the kinds of raw materials present and the ways in which these materials were used.

Shovel tests will be excavated at the discretion of the Project Archaeologist and will be dug in arbitrary 10 cm levels. All excavated earth will be passed through ¼ inch hardware cloth when possible. Heavy clays will have to be examined manually. Artifacts found in shovel tests will be collected and analyzed in the laboratory prior to curation. Shovel tests will be dug to the underlying clay or rocky subsoil when possible and to depths of about 100 cm when clay or rock is not reached. If clay or rock can't be reached through shovel testing, backhoe trenches will be excavated where appropriate. When a site is found, an attempt to determine its boundaries through shovel testing and surface inspection will be made.

The project will be documented through a shovel test log, backhoe trench log, field notes, and digital photography. A map will be drafted that depicts the location of all areas surveyed, including shovel tests and backhoe trenches.

All archaeological sites will be plotted on the proper USGS topographic quadrangle. Field numbers will be assigned to all sites until an official trinomial can be obtained TARL.

Artifact Analysis and Curation

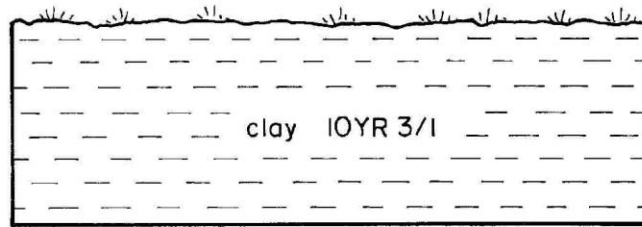
All significant artifacts will be collected for analysis in the laboratory. They will be described and measured. Those specimens deemed worthy of permanent curation will be processed and turned over to TARL. All artifacts not viewed as containing research potential for future researchers will be discarded following a written document authorizing this action from the Texas Historical Commission (THC), Archeology Division. Artifacts found on private property will be offered to the landowner.

Report Preparation

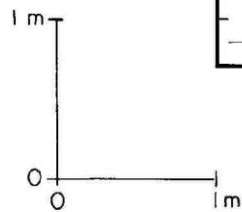
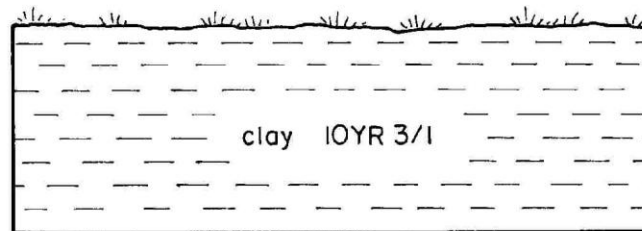
A report documenting the findings of this project will be written by the Principal Investigator. This report will follow the guidelines established by the Council of Texas Archeologists and THC. Two draft copies will be submitted to the THC for review. Upon acceptance of this report, 20 copies will be submitted to the THC for distribution to regional libraries.

APPENDIX III
BACKHOE TRENCH PROFILES

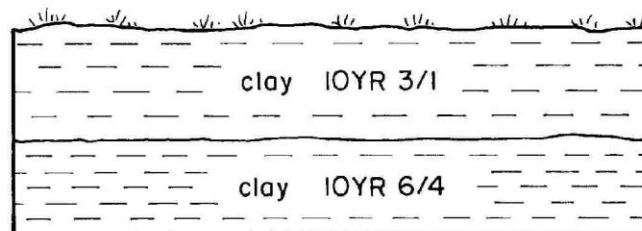
Backhoe Trench 1



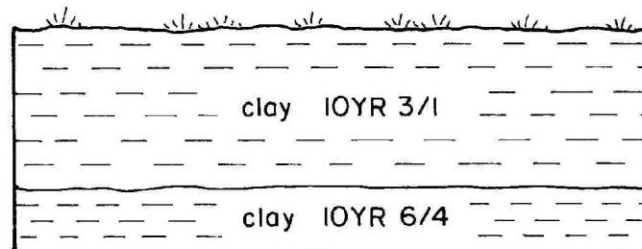
Backhoe Trench 2



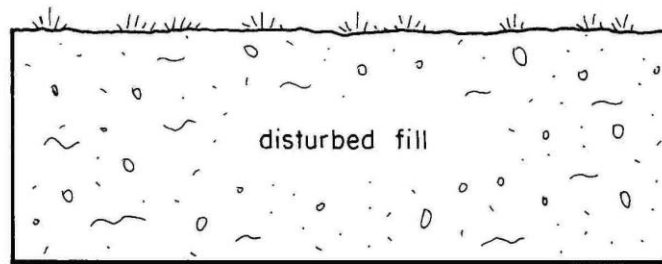
Backhoe Trench 3



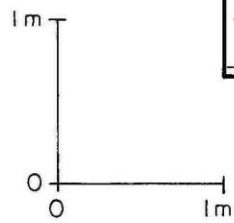
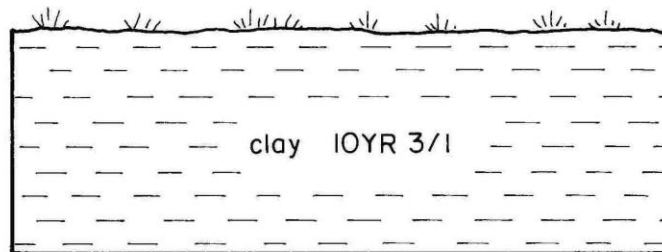
Backhoe Trench 4



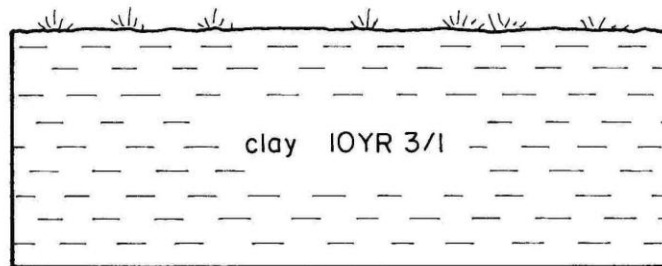
Backhoe Trench 5



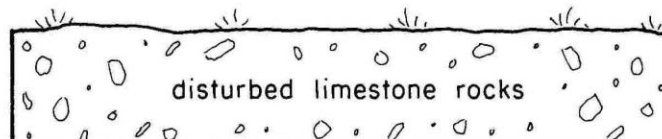
Backhoe Trench 6



Backhoe Trench 7



Backhoe Trench 8



APPENDIX IV

SHOVEL TEST LOG*

Shovel Test	Area	Depth (cm)	Comments
1	5	10	sandy loam over gray sandy clay
2	5	10	sandy loam over gray sandy clay
3	5	15	sandy loam over gray sandy clay
4	5	15	sandy loam over gray sandy clay
5	5	15	sandy loam over gray sandy clay
6	3	15	dug through clay (10YR 3/1)
7	3	15	dug through clay (10YR 3/1)
8	3	15	dug through clay (10YR 3/1)
9	3	15	dug through clay (10YR 3/1)
10	3	15	dug through clay (10YR 3/1)
11	4	10	dug through red clay
12	4	10	dug through red clay
13	4	10	dug through red clay
14	4	10	dug through red clay

*All tests were negative